WHAT IS CLAIMED IS:

1. A method of exposing a target material to an ion beam in an ion implantation system, the method comprising the steps of:
   quantifying an amount of ion beam neutralization; and
   controlling a characteristic of the ion beam of the implantation system based upon the amount of ion beam neutralization.

2. The method of claim 1, wherein the target material is a semiconductor substrate.

3. The method of Claim 1, wherein the target material is any substance to be implanted using the ion beam.

4. The method of claim 1, wherein the step of quantifying is conducted by a first device capable of detecting an ion beam and a second device capable of detecting an ion beam.

5. The method of claim 1, wherein a characteristic is selected from a group consisting of: beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

6. The method of claim 1, wherein the step of quantifying includes:

determining a reference ratio at a first ion beam current at a first location of a processing chamber and a second location of a processing chamber, wherein the first location is further from a first target of the ion beam than the second location;

determining a current ratio of a second ion beam current at the first location and the second location, wherein the second ion beam current is being used to process a second target;

determining a charge neutralization component of the ion beam at the second target location based on the reference ratio and the current ratio.

7. The method of Claim 6, wherein the reference ratio is determined when a relatively high-level, stable vacuum exists along the ion beam line and no target material is present.

8. The method of Claim 6, wherein the reference ratio is determined at the beginning of implantation when a relatively high-level, stable vacuum exists along the ion beam line and target material is present.

9. The method of claim 1, wherein the step of controlling includes:

modifying the ion dose based upon the charge neutralization component to create a total dose; and

adjusting a process parameter based on the total dose.

10. The method of claim 9, wherein a process parameter is selected from a group consisting of: beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

11. The method of Claim 4, wherein the second device is fixed in place and sited adjacent to the target position.

12. The method of Claim 4, wherein the second device is moveable and sited adjacent to the target position during measurement.

13. The method of Claim 4, wherein the second device is fixed in place and sited behind the target position.

14. The method of Claim 4, wherein the second device is moveable and sited behind the target position.

15. The method of Claim 4, wherein the second device is sited along the beam path to the target position.

16. The method of Claim 6, wherein the reference ratio is in the range of approximately 100:1 to 1:1.

17. The method of claim 16, wherein the range of the reference ratio is dependent upon the location of the first device with reference to the second device.

18. The method of Claim 16, wherein the reference ratio may be a previously stored value retrieved from control software.

19. A system comprising:
memory;
a processor operably connected to said memory;
a program of instructions, said program of instructions including instructions to manipulate said processor to:
quantify an amount of ion beam neutralization; and
control a characteristic of the ion beam of an ion implantation system based upon the amount of ion beam neutralization.

20. The system of claim 19, wherein the step of quantifying is conducted by a first device capable of detecting and ion beam and a second device capable of detecting an ion beam.

21. The system of claim 19, wherein a characteristic is selected from a group consisting of: beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

22. The system of claim 19, wherein the step of quantifying includes:
determining a reference ratio at a first ion beam current at a first location of a processing chamber and a second location of a processing chamber, wherein the first location is further from a first target of the ion beam than the second location;
determining a current ratio of a second ion beam current at the first location and the second location, wherein the second ion beam current is being used to process a second target;
determining a charge neutralization component of the ion beam at the second target location based on the reference ratio and the current ratio.

23. The system of claim 19, wherein the step of controlling includes:

modifying the ion dose based upon the charge neutralization component to create a total dose; and

adjusting a process parameter based on the total dose.

24. The system of claim 23, wherein a process parameter is selected from a group consisting of:

beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.